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*Textile Industry

ABSTRACT

Focusing on occupations in the clothing and baking industries, this document is one in a series of forty-one reprints from the Occupational Outlook Handbook providing current information and employment projections for individual occupations and industries through 1985. The specific occupations covered in this document include occupations in the apparel industry, occupations in the baking industry, occupations in laundry and drycleaning plants, and occupations in the textile mill products industry. The following information is presented for each occupation or occupational area: a code number referenced to the Dictionary of Occupational Titles; a description of the nature of the work; places of employment; training, other qualifications, and advancement; employment outlook; earnings and working conditions; and sources of additional information. In addition to the forty-one reprints covering individual occupations or occupational areas (CE 017 757-797), a companion document (CE 017 756) presents employment projections for the total labor market and discusses the relationship between job prospects and education. (BM)

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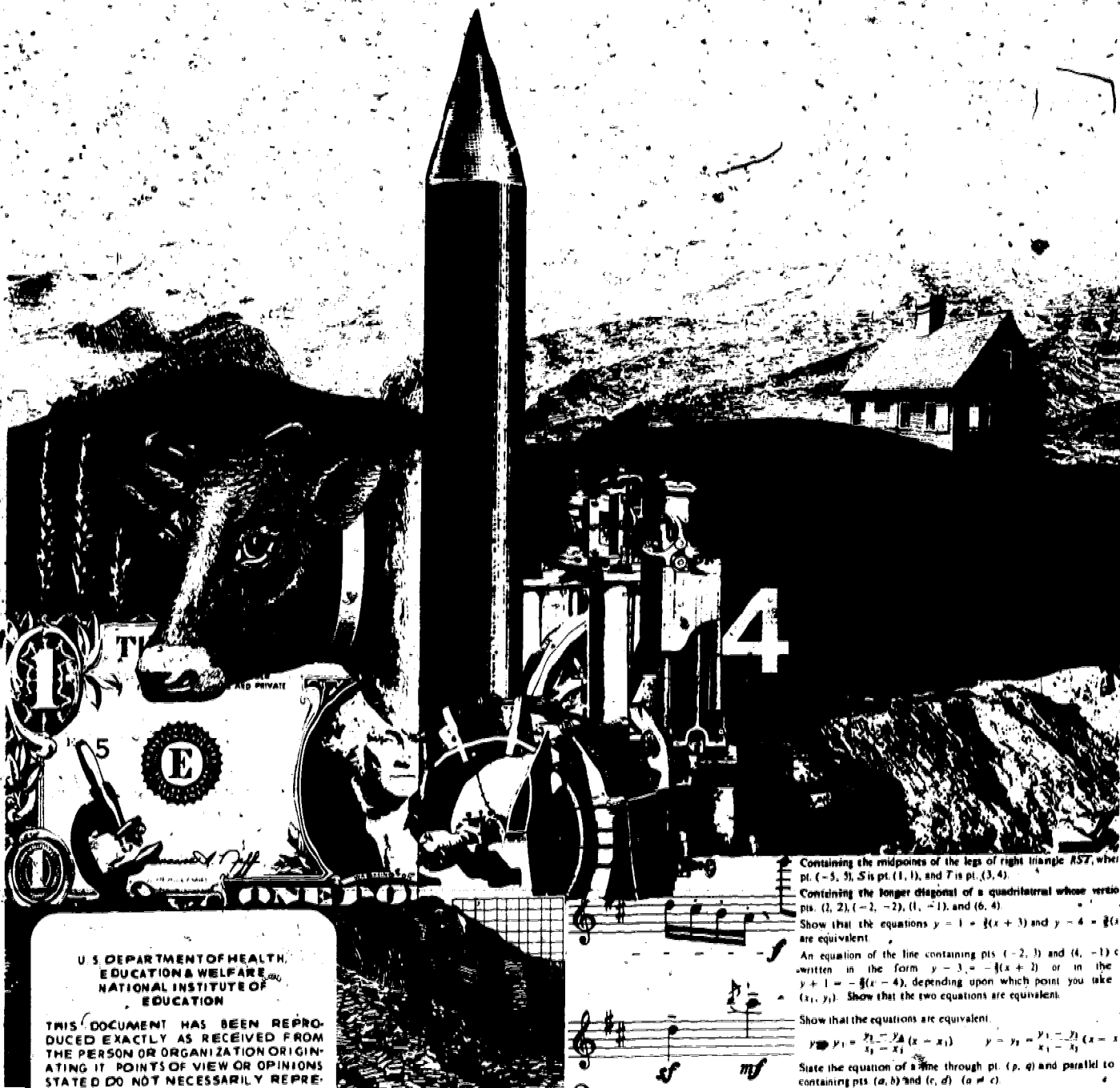
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Occupational Outlook Handbook,
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U.S. DEPARTMENT OF HEALTH,
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Containing the midpoints of the legs of right triangle AST , where $pt. (-5, 3)$, S is $pt. (1, 1)$, and T is $pt. (3, 4)$.

Containing the longer diagonal of a quadrilateral whose vertices are $(2, 2)$, $(-2, -2)$, $(1, -1)$, and $(6, 4)$.

Show that the equations $y - 1 = \frac{2}{3}(x + 3)$ and $y - 4 = \frac{2}{3}x$ are equivalent.

An equation of the line containing $pts. (-2, 3)$ and $(4, -1)$ can be written in the form $y - 3 = -\frac{2}{3}(x + 2)$ or in the form $y + 1 = -\frac{2}{3}(x - 4)$, depending upon which point you take (x_1, y_1) . Show that the two equations are equivalent.

Show that the equations are equivalent.

$$y - y_1 = \frac{y_2 - y_1}{x_2 - x_1}(x - x_1) \quad y - y_2 = \frac{y_1 - y_2}{x_1 - x_2}(x - x_2)$$

State the equation of a line through $pt. (p, q)$ and parallel to the line containing $pts. (a, b)$ and (c, d) ($a \neq c$).

OCCUPATIONS IN THE APPAREL INDUSTRY

Nature and Location of the Industry

The apparel industry produces clothes that not only are appropriate for the occasion—be it work, sleep, or leisure activities—but in such a wide variety of colors and styles that we can select apparel to match our mood and express our personality. In addition to clothes, the industry produces linens and drapes and other products made from cloth such as tents and parachutes. To do all this, the industry employs about 1.3 million people—nearly 4 out of 5 make clothes.

At the beginning of this century, the buildings and streets of Manhattan's Lower East Side bustled with apparel manufacturing activity. New York's styles became the standard for the rest of the country. Buyers for large, out-of-town department stores came to New York City to view new designs and to place orders for winter and summer fashions. Apparel firms in this city not only had the advantage of being near a concentration of buyers, but newly arrived immigrants provided them with an inexpensive supply of workers. New York City was then the undisputed apparel manufacturing capital of the country.

Today, New York City is no longer the Nation's dominant apparel center, although it is still important—almost 1 out of every 5 employees in the industry works in or around New York City. However, many firms have moved to the South so as to lower their taxes and labor costs. As a result, about 25 percent of the industry's employees work in North Carolina, Georgia, Texas, Tennessee, South Carolina, and Alabama. Other firms have moved to large cities such as Los Angeles, Chicago, Boston, St. Louis, and Dallas, where large clothing markets exist.

More than half of the industry's workers are employed in firms that have over 100 employees. Only 1 plant in 7, however, is this large. The limited investment required to cut and sew garments, and the specialization of firms in one operation, such as cutting, allow small firms to enter

this industry with relative ease. In the women's and misses' outerwear sector of this industry, for instance, the majority of the cut and sewn garments originate in New York City, but much of the sewing is contracted out to firms spread throughout the Middle Atlantic States. Plants manufacturing men's wear usually are larger than those making women's garments because men's clothing undergoes less frequent changes in design and style and thus is better suited to mass production methods.

Occupations in the Industry

Apparel industry employees, most of whom are directly involved in the production process, carry out the major operations of designing and pattern making, cutting and marking, sewing, and pressing. About half of all apparel employees are hand sewers or sewing machine operators. Generally, high grade and style-oriented apparel is more carefully designed and involves more handwork than cheaper, more standardized items. For example, some hand detailing goes into a fashionable cocktail dress or a high-priced suit or coat, while items such as undershirts and overalls usually are sewn entirely by machine. To make the many different kinds of garments, workers with various skills and educational backgrounds are needed.

Designing Room Occupations. Typically, the manufacturing process begins with the *designer* (D.O.T. 142.081), who creates new types and styles of apparel. Inspiration for a new design may come from any of a variety of experiences—traveling, observing life styles, and looking at paintings and other sources of information about how people dressed in the past, to name but a few. In addition to creativity, designers must have practical knowledge of the apparel business so that they can translate their ideas into styles that can be produced at competitive prices. They must, for example, be familiar with labor processes and costs for various factory operations such as pattern

making, cutting, sewing, and pressing.

A large manufacturer generally has a head designer and several assistants. Many small firms, however, do not employ designers but purchase readymade designs or patterns or copy higher priced designs.

A designer usually works with one type of apparel, such as suits or dresses, although some work with several. For a high-quality dress, designers usually start by drawing sketches or draping muslin on a manikin and choosing fabrics, trim, and colors. Using these sketches as guides, designers and their assistants make an experimental dress. They cut materials and pin, sew, and adjust the dress on a form or a live model until it matches the sketch.

Sample makers (D.O.T. 785.381) use this experimental dress as a guide in cutting and sewing fabrics to make a finished sample of the dress. After management has approved the sample, a **pattern maker** (D.O.T. 781.381) constructs a master pattern. Working closely with the designer, the pattern maker translates the sketch or sample dress into paper or fiberboard pieces, each one representing a part of the garment. A **pattern grader** (D.O.T. 781.381) measures the pieces that make up this master pattern, and modifies them to fit various sizes. To speed up this process, some large plants use computers to draw up the patterns for each size.

Styles for many items, such as men's suits and jackets, do not change significantly from year to year; thus, some of the steps described above are not required. A designer may alter the style of a suit, for example, by simply making minor changes on the master pattern.

Cutting Room Occupations. Workers in the cutting room prepare cloth for sewing. There are five basic operations in the cutting department: Spreading, marking, cutting, assembling, and ticketing. Small shops may combine two or more of these operations into a single job.

Hand spreaders (D.O.T. 781.887) lay out bolts of cloth into exact lengths on the cutting table. **Machine spreaders** (D.O.T. 781.884) are aided



Markers arrange pattern pieces to get the greatest number of garments from the smallest quantity of cloth.

by machines in laying the cloth evenly across the table.

Markers (D.O.T. 781.484) trace the fiberboard pattern pieces on large sheets of paper, and may make several carbons of these tracings. In some cases they trace the pattern pieces with chalk directly on the cloth itself, rather than on paper.

Following the pattern's outline on the cloth, a **cutter** (D.O.T. 781.884) cuts out the various garment pieces from layers of cloth. Sometimes these layers are as high as 9 inches. Using an electrically powered knife, the cutter slices through all the layers at once. The work of a cutter and a marker frequently is combined into a single job.

The pieces of cloth that have been cut are prepared for the sewing room by another group of specialized workers. **Assemblers**, sometimes called **bundlers** or **fitters** (D.O.T. 781.687), bring together and bundle the pieces and accessories (linings, tapes, and trimmings) needed to make a complete garment. They match color, size, and fabric design and use chalk or thread to mark locations for pockets, buttonholes, buttons, and other trimmings. They identify each bundle with a ticket, which is also used to figure the earn-

ings of workers who are paid according to the number of pieces they produce. The bundles then are routed to the various sections of the sewing room.

Sewing Room Occupations. Most production workers in the apparel industry are hand sewers and sewing machine operators. Although hand sewers are needed in the production of expensive garments and to put the finishing touches on moderate-priced clothing, sewing machine operators constitute the great majority of workers in this area.

Using industrial machines that are heavier and run faster than the ones found in the home, **sewing machine operators** (D.O.T. 787.782) generally specialize in a single operation such as sewing shoulder seams, attaching cuffs to sleeves, or hemming blouses. Some make sections such as pockets, collars, or sleeves; others assemble and join these completed sections to the main parts of the garment.

Sewing machine operators generally are classified by the type of machine they use, such as single-needle sewing machine operator or blind-stitch machine operator, and by the type of work performed, such as collar stitcher or sleeve finisher.

Most hand sewing is done on bet-

ter quality or highly styled dresses, suits, and coats. **Hand sewers** (D.O.T. 782.884) use needle and thread to perform various operations ranging from simple sewing to complex stitching. Many hand sewers specialize in a single operation, such as lapel basting or lining stitching.

Instead of being sewn, parts such as collars and lapels may be "fused" together by heat and pressure. A **fusing machine operator** places the garment part on a loading platform of a fusing press that is adjusted to apply the precise amount of pressure and temperature needed for a permanent bond.

In a typical apparel plant, each operator in the sewing department performs one or two assigned tasks on each piece in a bundle of cut garment pieces, and then passes the bundle to the next operator. Many plants employ **material handlers** (D.O.T. 929.887) who move garment bundles from one sewing operation to another.

At various stages of the sewing operations, **inspectors** and **checkers** (D.O.T. 789.687) examine garments. They mark defects, such as skipped stitches or bad seams, which the inspectors sometimes repair before the garments are passed on to the next sewing operation. **Hand trimmers** (D.O.T. 781.887), often called thread trimmers and cleaners, remove loose threads, basting stitches, and lint from garments.

Tailoring Occupations. **Tailors** (D.O.T. 785.261 and 381) and **dressmakers** (D.O.T. 785.361) are skilled workers who do difficult kinds of hand and machine sewing. Most are employed in making expensive clothing that needs precise shaping and finishing. Although some tailors and dressmakers make complete garments, most specialize in a few operations such as collar setting and lapel padding.

Bushelers (D.O.T. 785.281) are tailors who repair defects in finished garments rejected by the inspector. They alter parts that have not been sewn correctly, rearrange padding in coats and suits, and do other sewing necessary to correct defects.



Sewing machine operators use machines that are heavier and run faster than the ones found in the home.

Pressing Occupations. The shape and appearance of the finished garments depend, to a large extent, on the pressing that is done during and after sewing operations.

Pressers (D.O.T. 363.782, .884, and .885), sometimes working with manikins and body forms, use various types of steam pressing machines or hand irons to flatten seams and shape parts and finished garments. There are two basic types of pressers—underpressers and finish pressers. Underpressers specialize on particular garment parts, such as collars, shoulders, seams, or pockets. Their duties vary from simple smoothing of cloth and flattening of seams to skillful shaping of garment parts. Finish pressers generally do final pressing and ironing at the end of the sewing operations.

Fur Shop Occupations. Because furs are expensive and difficult to work with, making a fur garment requires workers who have special skills not found in plants that make other types of apparel.

The most skilled worker in a fur garment plant is the *fur cutter* (D.O.T. 783.781), who also may be the supervisor. The cutter selects and matches enough fur skins to make a single garment, such as a coat or jacket, and arranges and cuts the skins on pattern pieces so that the choice sections of fur are placed

where they will show. Following the sewing instructions given by the cutter, *fur machine operators* (D.O.T. 787.782) sew these pelts together to make garment sections. A *fur nailer* (D.O.T. 783.884), after wetting and stretching the garment sections, either staples or nails them on a board so that they will cover the pattern. When the sections are dry, this worker removes them from the board. To complete the garment, the fur machine operator then finishes sewing the various sections, and *fur finishers* (D.O.T. 783.381) sew in the lining, tape edges, make pockets, and sew on buttons and loops.

Administrative, Sales, and Maintenance Occupations. Most administrative positions in an apparel plant are in the production department. Production managers are responsible for estimating production costs, scheduling the flow of work, hiring and training workers, controlling quality, and supervising the overall production activities of the plant. In some small apparel firms, the production manager also is a designer.

Industrial engineers advise management about the efficient use of machines, materials, and workers. (Further discussion of industrial engineers is included elsewhere in the *Handbook*.)

Clerks, bookkeepers, stenographers, and other office workers make

up payrolls, prepare invoices, keep records, and attend to other paperwork. In some large plants, many clerical functions are handled with computers. This requires keypunch operators, computer programmers and operators, and systems analysts. Sales workers, fabric buyers, models, accountants, and sewing machine mechanics and technicians are among other types of workers in the apparel industry. Discussions of many of these jobs can be found elsewhere in the *Handbook*.

Training, Other Qualifications, and Advancement

Most workers in the apparel industry pick up their skills on the job by helping and observing experienced workers. The length of time required for on-the-job training ranges from a few weeks to several years, depending on the type of occupation, the worker's aptitude, and the employer's training program. A relatively small number of employees are trained in formal apprenticeship programs for highly skilled occupations, such as pattern maker, cutter, and tailor. Some employees take courses in pattern making, cutting, and tailoring, as well as machine and hand sewing, at private and public schools in apparel manufacturing centers.

Many production jobs do not require much physical exertion. Good eyesight and manual dexterity, however, are vital.

Entry into beginning hand-or machine-sewing jobs is relatively easy, since there are few restrictions regarding education and physical condition. An increasing number of workers, however, are receiving training in high school and vocational schools. New workers start by sewing straight seams, under the supervision of a skilled worker or supervisor, and progress to more complicated sewing as they gain experience. Many large companies have special in-plant training programs for sewing machine operators. The operator is taught how to perform each operation with minimal finger, arm, and body movement. The ability to do routine work rapidly is essential, since nearly all sewers are paid by the number of pieces they produce.

Some sewers advance to supervisory positions. Most, however, stay on the same general operation throughout their working lives and can look forward only to moving from simple sewing tasks to more complicated ones that pay higher piece rates.

New workers in cutting rooms usually begin as assemblers (bundlers or fitters). Speed, patience, and the ability to match colors are necessary for these jobs. An assembler may be promoted to spreader, and after a few years, to marker or cutter.

Most pattern makers pick up the skills of the trade by working for several years as helpers to experienced pattern makers. Cutters and pattern graders occasionally are promoted to pattern making. Pattern makers must be able to visualize from a sketch or model the size, shape, and number of pattern pieces required for a particular garment. They also must have a knowledge of fabrics, body proportions, and garment construction.

For beginning tailor and dressmaking jobs, many employers prefer to hire vocational school graduates who have had courses in these subjects. With a few years of additional apprenticeship or informal on-the-job training, graduates can qualify as skilled workers. Some of these workers eventually become designers or supervisors. They can also transfer to

jobs outside the apparel manufacturing industry as fitters and alteration tailors in clothing stores and dry-cleaning shops.

Pressers usually begin as underpressers, working on simple seams and garment parts. Underpressing can be learned in a short time, and the worker can progress to the more difficult job of finish presser. These workers also can transfer to pressing jobs in drycleaning shops.

Many apparel firms prefer to recruit designers from colleges that offer specialized training in this field. Graduates usually start as assistant designers or sample makers. Some designers, however, have come up through the ranks by advancing from cutting, pattern making, or tailoring jobs.

Designers need a thorough knowledge of fabrics, a keen sense of color, and the ability to translate design ideas into a finished garment. They should also acquaint themselves with garmentmaking techniques by working briefly in various plant jobs, such as sample making, pattern making, cutting, and machine sewing. Designers should know how to sketch.

Production managers and industrial engineers often begin as management trainees. A college education increasingly is being required for these jobs. For those without a college background, many years of on-

the-job training in all production processes, ranging from selection of fabrics to shipment of finished apparel, are required to qualify as a production manager.

Employment Outlook

Apparel industry employment is expected to grow about as fast as the average for all industries through the mid-1980's. Most job openings will arise from the need to replace experienced workers who retire, die, or transfer to other fields of work. The number of openings may fluctuate greatly from year to year, as the demand for apparel is highly sensitive to changes in the economy.

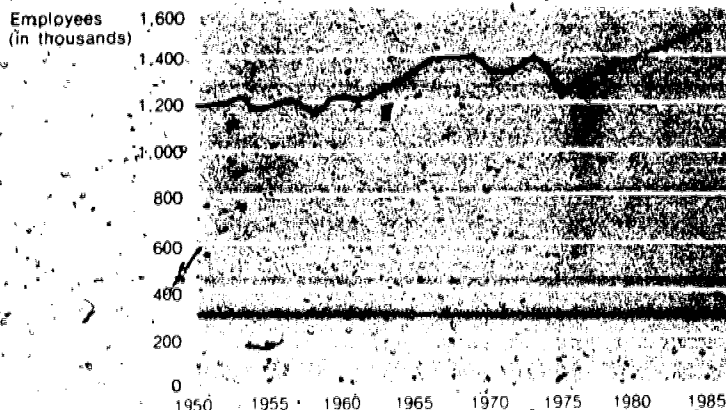
Demand for apparel is expected to increase over the long run as population and incomes continue to grow. The industry's greater emphasis on styling also may stimulate demand. Employment in the industry, however, is not expected to keep pace with the production of apparel, because new mechanized equipment and improved methods of production and distribution are expected to result in greater output per worker. Examples of laborsaving equipment include sewing machines that can position needles and trim threads automatically; devices that automatically position fabric pieces under the needle and remove and stack completed pieces; and computer-controlled pattern making, grading, and cutting. Computers also are improving managerial control over sales, inventories, shipping, and production.

Despite technological advances in equipment, extensive application of automatic laborsaving equipment to the production process is difficult because of the variety of items produced and the frequent style and seasonal changes, particularly in clothing. For these and other reasons, apparel manufacturing operations will continue to require much manual labor. Most employment opportunities will be for sewing machine operators, as this occupational group constitutes approximately 50 percent of total industry employment.

Opportunities are expected to be particularly favorable for production managers and engineers with college degrees in apparel management, en-

The number of jobs in the apparel industry fluctuates with the economy

Wage and salary workers in the apparel industry, 1950-76 and projected 1985



Source: Bureau of Labor Statistics

Table 1. Average hourly earnings of production workers in the men's and boys' suits and coats industry, selected occupations and areas, 1976

Men's and boys' suits and coats	Estimated average hourly earnings		
	New York, N.Y.—N.J. metropolitan area	Baltimore	Philadelphia
All production workers.....	\$4.51	\$4.23	\$4.47
Cutters and markers.....	6.95	5.06	6.39
Finishers, hand, coat fabrication.....	3.81	3.88	3.89
Pressers, finish, machine, coat fabrication.....	4.99	5.20	5.98
Sewing machine operators, coat fabrication.....	4.60	4.12	4.47
Sewing machine operators, trouser fabrication.....	4.50	3.69	3.95

bustle of the sewing and pressing operations, and designing, pattern making, and cutting jobs are more interesting and less monotonous than most other apparel jobs.

Sources of Additional Information

Information on vocational and high schools that offer training in designing, tailoring, and sewing may be obtained from the Division of Vocational Education of the Department of Education in each State capital.

Information on apprenticeships may be obtained from the Apprenticeship Council of the State labor department or the local office of State employment service. Some local employment service offices administer tests to determine aptitudes that are important for many apparel industry jobs.

For general information on jobs in the industry and information on schools that offer degrees in apparel management, engineering technology for apparel, design, and related professional and vocational fields, write to:

American Apparel Manufacturers Association, Suite 800, 1611 Kent St., Arlington, Va. 22209.

Amalgamated Clothing and Textile Workers' Union, 15 Union Square, New York, N.Y. 10003.

Fur Information and Fashion Council, 101 W. 30th St., New York, N.Y. 10001.

International Ladies' Garment Workers' Union, 1710 Broadway, New York, N.Y. 10019.

National Outerwear and Sportswear Association, Inc., 1 Pennsylvania Plaza, New York, N.Y. 10001.

United Garment Workers of America, Room 1614, 200 Park Ave. South, New York, N.Y. 10003.

Apparel Manufacturers' Association, 1440 Broadway, New York, N.Y. 10018.

National Knitted Outerwear Association, 51 Madison Ave., New York, N.Y. 10010.

engineering technology for apparel, and industrial engineering, as well as for sales workers, fabric buyers, and sewing machine mechanics. Job opportunities also should be favorable for the more high skilled craft workers such as pattern makers, cutters, pressers, finishers, and tailors. People who plan to become designers, on the other hand, will face keen competition, because the number of people trying to get into this field exceeds the number of available jobs.

Earnings and Working Conditions

Earnings in the apparel industry are relatively low. In 1976, production workers in apparel averaged \$3.41 an hour, compared with \$4.87 an hour for those in all private industries, except farming.

Average hourly earnings of production workers varied among different kinds of apparel plants, ranging from \$3.03 in plants that made hats, caps, and millinery to \$4.18 in those that made men's and boys' suits and coats. Earnings of apparel workers also varied by occupation and geographic area. Table 1 gives estimated average hourly earnings in 1976 for selected occupations and areas in one segment of the industry.

Because most production workers in the apparel industry are paid by the number of pieces they produce, their total earnings depend upon speed as well as skill.

Many apparel workers are union members, particularly those who work in metropolitan areas. The major unions in this industry are the International Ladies' Garment Workers' Union, the Amalgamated Clothing and Textile Workers' Union, and the United Garment Workers of America. Some of these unions sponsor health care and child day care centers, cooperative housing, and vacation resorts for the benefit of their members.

Workers may be laid off for several weeks during slack seasons, particularly in plants that make seasonal garments, such as women's coats and suits. Employment is usually more stable in plants that produce standardized garments, such as pajamas and men's shirts, which are worn all year. In many plants, the available work during slack periods is divided so that all workers can be assured of at least some earnings.

While many plants are housed in old buildings, others are located in modern buildings that have ample work space, good lighting, and air-conditioning. Because most employees sit when they sew, the work is not physically strenuous, but the pace is rapid and many tasks are monotonous.

Working conditions in cutting and designing rooms are more pleasant than in the sewing and pressing areas. The cutting and designing rooms are in an area away from the hustle and

OCCUPATIONS IN THE BAKING INDUSTRY

The baking industry—one of the Nation's largest food-processing employers—provides steady, year-round employment for thousands of workers throughout the country. Jobs exist to suit a wide variety of interests, skills, and talents. Bakery workers make, wrap, pack, sell, and deliver products. Mechanics maintain and repair plant machinery and service delivery trucks. Managers and sales specialists direct operations and clerical workers perform regular office duties.

Nature and Location of the Industry

About 240,000 persons worked in the Nation's 3,500 industrial bakeries in 1976. More than 4 out of 5 worked in bakeries that produced perishable goods such as bread, rolls, pies, cakes, and doughnuts. The remainder worked in those that made "dry" goods such as cookies, crackers, and pretzels.

Although there are many small bakeries, the larger plants account for most of the employment. About three-fourths of the industry's employees are in plants with more than 100 workers.

Most jobs are concentrated in metropolitan areas and most of the industry's employees are production workers. They do the baking, handle raw materials, maintain equipment, wrap and pack products, and keep the bakeries clean. Nearly 1 out of 4 drives a truck to deliver the industry's products; most of these workers sell to retail stores. Other drivers with no sales duties deliver bakery products to distribution centers, hotels, restaurants, and stores. The remaining 20 percent of the work force are in administrative, professional, technical, and clerical jobs.

Production Occupations. Although not all baked goods are made in exactly the same way, most bakery production jobs are similar. Produc-

tion workers blend, sift, and mix ingredients to form a dough; shape and bake the dough; and wrap and pack the final product.

Since bread is the primary product of the industry, occupations described here are those found in a bread bakery. Jobs may differ somewhat in a bakery that makes other products or is more automated.

The first step in baking is to combine the ingredients needed to make dough. *Mixers* (D.O.T. 520.885) load blending machines with the exact amounts of flour, water, and yeast needed for the bread. Using instruments, they carefully control the temperature, timing, and mixing speed of the machines to insure a uniform, well-blended dough. The mixed dough is dropped into a trough and pushed to a warm proofing room where the yeast ferments and the dough rises. The risen dough is poured back into the blender and sugar, salt, shortening, and more flour and water are added. The dough is allowed to rise again before it is shaped into loaves.

Divider machine operators (D.O.T. 520.885) run machines that divide, round, proof, and shape dough into loaf-size balls. A conveyor carries these balls of dough to *dough molders* or *molding machine operators* (D.O.T. 520.885) who press out the air bubbles, form the balls into loaves; and drop the loaves into pans. If bread or rolls are to be made in fancy shapes, *bench hands* (D.O.T. 520.884) knead and form the dough by hand.

The pans of dough go back to the proofing room for about an hour before being placed in the oven. *Oven tenders* (D.O.T. 526.885) load and unload the ovens and adjust the temperature and timing of the ovens to make sure that the bread is properly baked.

Some bakeries use an automatic process called "continuous mix" that eliminates many of the steps described above. With this process, all ingredients are mixed at once and the dough is divided, shaped, put into pans, and then proofed only once before baking.

In small bakeries, *all-round bakers* (D.O.T. 526.781) assisted by help-



Divider machine operator runs machine that divides and shapes dough into loaves.



Oven tender loading pans of dough into oven.

ers, usually handle all the steps needed to turn out finished baked products. In large bakeries, all-round bakers are employed as working supervisors. They direct their employees and coordinate their activity with other departments to meet production schedules.

A considerable number of *helpers* (D.O.T. 526.886) are employed in baking operations to grease pans, remove bread from pans, push troughs and racks, and wash pans. They may assist all-round bakers and other workers. They have job titles such as doughmixer helper, and oven tender helper.

After baked goods are cooled, several types of workers prepare them for delivery to customers. *Slicing-and-wrapping machine operators* (D.O.T. 521.885) feed loaves of bread onto conveyors leading to the machines, watch the slicing and wrapping operations, adjust the machines, and keep them supplied with bags and labels. A conveyor then takes the wrapped loaves to the shipping platform.

Bakery employees in icing departments give finishing touches to

cakes, pastries, and other sweet goods following special formulas of the bakery. *Icing mixers* (D.O.T. 520.885) weigh and measure ingredients and mix cake icings and fillings by machine. They also prepare cooked fillings for pies, tarts, and other pastries. *Hand icers* (D.O.T. 524.884) are skilled workers who decorate special products such as wedding cakes, birthday cakes, and fancy pastries. When the product is uniform or requires no special decoration, the frosting may be applied by *machine icers* (D.O.T. 524.885).

Bakeries also employ many workers in storage, warehousing, and shipping departments. Receiving and stock clerks check, record, and deliver incoming supplies and ingredients to various departments. Packers and checkers make up orders of bakery products for delivery by route drivers.

Maintenance Occupations. Bakeries employ skilled maintenance workers such as machinists, electricians, and stationary engineers to keep machinery and equipment in good condition. Large plants need many of these workers because their baking opera-

tions are highly mechanized. Many bakeries also employ truck mechanics to service their delivery trucks.

Sales and Driving Occupations. Selling and delivering finished baked foods requires many thousands of workers. Some sell baked goods, some drive trucks, and many do both.

Route drivers (D.O.T. 292.358) work for wholesale bakeries. They deliver baked foods to grocery stores along their routes and collect payment. Attracting new customers and urging old customers to buy more products are major parts of their job. Route drivers usually arrange their baked goods on shelves or display racks in grocery stores although some stores have begun to use their own employees to stock shelves. Drivers also list the items they think the grocers will buy the next day; these lists are used to help make up the bakery production schedule for the next morning.

Route supervisors assign delivery routes and check delivery schedules. They train new route drivers and may temporarily replace those who are absent. A large bakery may employ several supervisors, each in charge of 6 to 10 route drivers.

Chain grocery store bakeries and multioutlet retail bakeries employ truckdrivers rather than route drivers to deliver baked foods to each of their company's stores. Truckdrivers do not have sales duties, nor, in most areas, do they stock shelves. Each store's stock clerks or sales clerks arrange the displays of baked foods.

Administrative, Clerical, and Professional and Technical Occupations. Administrators in large bakeries and owners of small bakeries coordinate all baking activities, from the purchase of raw materials to the production and delivery of finished goods. In large firms, activities are divided into separate departments or functions and are supervised by plant managers, comptrollers, sales managers, and other executives. Some administrative employees specialize in fields such as accounting, purchasing, advertising, personnel, and industrial relations. Bakeries employ many types of clerical workers, in-

cluding bookkeepers, cashiers, clerks, business machine operators, typists, and switchboard operators. Some large baking companies have laboratories and test kitchens where chemists, home economists, and their assistants test ingredients and prepare formulas and recipes. (Detailed discussion of the duties, training, and employment outlook for maintenance, sales, driving, administrative, clerical, and technical personnel appear elsewhere in the *Handbook*.)

Training, Other Qualifications, and Advancement

Training requirements for occupations in the baking industry range from a few days on the job to several years of experience or advanced education. Slicing and wrapping machine operators can learn their job in a few days, but skilled workers, such as all-round bakers, mixers, oven tenders, and other baking specialists, need 3 or 4 years of training. Professional personnel and some administrative workers must have a college degree or considerable experience in their specialty.

Most inexperienced production workers in the baking industry are hired as helpers. They usually are assigned such tasks as carrying ingredients to mixing machines, or pushing troughs of dough to the proofing

room. Many workers who become all-round bakers begin as baker's helpers. They learn more advanced baking skills while working alongside experienced bakers, and may be selected to enter an apprenticeship program. Employers usually require an apprentice to be at least 18 years old and have a high school or vocational school diploma. Apprenticeship programs last 3 or 4 years, and include on-the-job training in all baking operations and classroom instruction in related subjects.

Some workers take courses in vocational school or learn baking in the Armed Forces. Such training may not qualify a person as a skilled baker, but it may help in getting a job as an apprentice or shorten the apprenticeship training period.

Bakers may be promoted to jobs such as working or department supervisors. Some bakers who have developed special skill in fancy cake-making or piemaking may find jobs in hotel or restaurant bakeries. All-round bakers with some business ability sometimes open their own bakeshops.

Production employees must be in good health. Most States require a health certificate indicating that the worker is free from contagious diseases. Good health also is important because of the high temperature in bakeries.

Some bakeries have apprenticeship programs for maintenance workers such as machinists, electricians, and mechanics. Others train maintenance workers informally on the job. Some bakeries hire only maintenance workers who are already skilled.

For route drivers or truckdrivers, baking firms generally hire inexperienced people with a high school education. These workers often begin as stock clerks, packers, or checkers, and are promoted to driving jobs. Applicants must be able to get a chauffeur's license and sometimes are tested by the baking companies to determine whether they are safe drivers. Classroom instruction in sales, display, and delivery procedures is sometimes given to new route drivers, but most training is given on the job by supervisors. Route drivers may be promoted to route supervisors or sales managers.

Administrative jobs usually are filled by upgrading personnel already employed in the firm. Some owners and production managers of bakeries have been plant workers or were in sales occupations. In recent years, large baking firms have required their new administrative workers to have a college degree in an administrative field, such as marketing, accounting, labor relations, personnel, or advertising. Kansas State University at Manhattan offers a bachelor of science degree in bakery science and management. The American Institute of Baking conducts a school of baking for persons who wish to qualify for managerial positions. Applicants must have a high school diploma and 2 years of baking experience or equivalent time in college.

Persons who have completed a commercial course in high school, junior college, or a business school usually are preferred for secretarial, stenographic, and other clerical jobs.

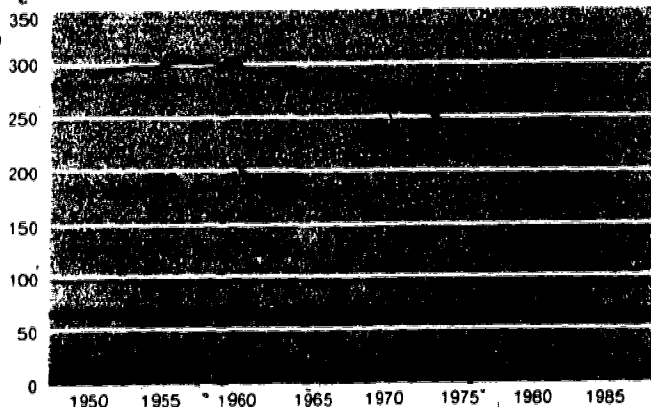
Employment Outlook

Employment in the baking industry is expected to decline through the mid-1980's. Nevertheless, several thousand job openings are anticipated each year because of the need to replace workers who retire, die, or transfer to other fields of work.

Technological innovations enable bakeries to meet increased demand with fewer employees

Wage and salary workers in the baking industry, 1950-76 and projected 1985

Employees
(in thousands)



Source: Bureau of Labor Statistics

Population growth will increase the demand for bakery products. However, labor-saving technological innovations will enable many bakeries, particularly large industrial ones, to meet the demand with fewer employees. Pneumatic handling systems and pumps quickly and easily transfer ingredients from trucks or railroad cars to storage containers. The "continuous mix" process eliminates doughmixing and proofing operations, and conveyor systems move panned dough from ovens to labeling machines in one continuous process. In addition, some bakeries can prepare a week's baked goods at one time and store them in the freezer until needed.

Earnings and Working Conditions

In 1976, earnings of production workers in the baking industry averaged \$202.27 a week, or \$5.16 an hour, which is slightly higher than the average for all workers in private industry, except farming.

Under the terms of union contracts covering employees in some wholesale bakeries producing bread and related products, minimum hourly rates in major occupations in 1976 were as follows:

Baking supervisors.....	\$5.84-7.49
All-round bakers and mixers	4.81-7.04
Molders and dividers and molding and dividing machine operators.....	4.62-7.04
Oven tenders.....	4.81-7.04
Baker's helpers	4.44-6.95
Wrapping machine operators	4.81-6.29

Some plant employees work night shifts and weekends because many bakeries operate around the clock. Some bakeries are eliminating the night shift since baked goods can be frozen and stored until needed. Most plant workers are on a 40-hour work-week, but some work 35 or 37 1/2 hours, and others 44 to 48 hours.

Route drivers usually receive a guaranteed minimum salary plus a percentage of their sales. According to limited information from union contracts, route drivers for wholesale bakeries had minimum weekly salaries of from \$123 to \$283 in 1976. By

selling more baked products to more customers, route drivers can increase their earnings. Companies generally pay for uniforms and their maintenance.

Working conditions in bakeries are generally good. However, many jobs involve some strenuous physical work, despite the considerable mechanization of baking processes. Work near ovens can be uncomfortably hot.

Nearly all employees of industrial baking firms get paid vacations, which usually range from 1 to 5 weeks according to length of service. Employees also get from 5 to 11 paid holidays, depending on the locality. Most baking companies have life and health insurance programs and retirement pension plans. Many employees are covered by joint union-industry plans that are paid for entirely by the company.

Many bakery workers belong to labor unions. Bakers and other plant workers are organized by the Bakery and Confectionary Workers' Interna-

tional Union of America, and route drivers and truck drivers usually are members of the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America (Ind.). Some maintenance workers are members of craft unions such as the International Association of Machinists and Aerospace Workers and the International Union of Operating Engineers.

Sources of Additional Information

Information on baking jobs and training opportunities may be obtained from bakeries in the community, local offices of the State employment service, or locals of the labor unions noted previously.

For general information on job opportunities in the industry and on schools that offer courses or degrees in baking science and technology, write to:

American Bakers Association, 2020 K St. NW., Suite 850, Washington, D.C. 20006.

OCCUPATIONS IN LAUNDRY AND DRYCLEANING PLANTS

Nature of the Work

One way to describe the work done in this industry is to follow an imaginary bundle of clothes from the time it leaves the customer until it is cleaned and returned. (See accompanying chart.) The bundle consists of some men's shirts, a business suit, and bed linens. A *route driver* (D.O.T. 292.358) picks up the bundle and, after leaving a receipt, takes the bundle to the plant.

The owner of the bundle may instead leave it at the plant or drive-up store. In this case, a *counter clerk* (D.O.T. 369.887) makes out a receipt. Either the route driver or the counter clerk sorts the items in the bundle into laundry and drycleaning.

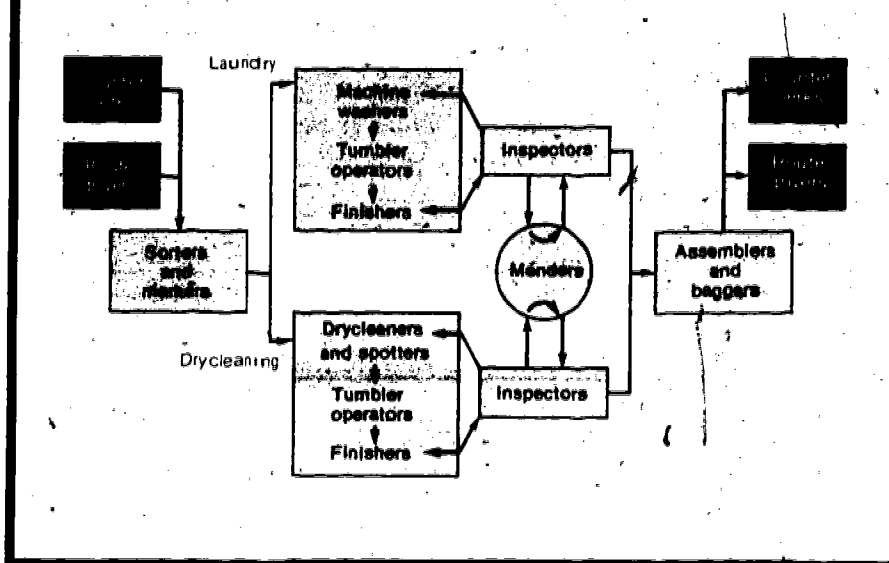
The bundle is turned over to a *marker* (D.O.T. 369.887), who puts an identifying symbol on each item so it may be matched with the customer's receipt at some later time.

In 1976, approximately 418,000 persons were employed by establishments that launder and dryclean garments, household furnishings, and institutional linens and uniforms. These workers were employed throughout the country, but were concentrated in metropolitan areas.

Drycleaning firms and laundries accounted for about three-fourths of the industry's workers. Most of the remainder worked for firms that specialized in renting and cleaning uniforms, towels, diapers, and other linens. A small proportion were employed in valet shops.

More than half of the industry's employment is found in firms that have 20 employees or more. Most firms, however, are owner-operated and have fewer than 10 employees. In 1976, about one-seventh of the industry's workers were self-employed.

How work flows through a laundry and drycleaning plant



The marker then sends the shirts and sheets to the washroom and the suit to the drycleaning room.

A *machine washer* (D.O.T. 361.885) puts several hundred pounds of sheets into a huge washing machine. Shirts are loaded into another washer. These machines are controlled automatically, but the machine washer must understand how to operate the controls—water temperature, suds level, time cycles, and the amount of agitation for different fabrics. When the washing cycle is completed, the laundry is transferred to an extractor that removes about half of the water. This stage is similar

to the “spin” cycle on a home washer. Conveyors move the laundry to conditioners, dryers, or tumblers where dry, heated air removes some of the remaining moisture.

Sheets go from the drying area to *flatwork finishers* (D.O.T. 363.886), who shake out folds and creases, spread the sheets on moving belts, and feed them into large flatwork ironing machines for ironing and partial folding. When the sheets come out of the machine, other finishers complete the folding and stacking.

Shirts go directly from the extractor to *shirt finishers* (D.O.T. 363.782), who usually work in teams

of two or three. One finisher puts the sleeves of the shirt on a “sleever,” which has two armlike forms. A second finisher then puts the shirt on a “triple-head” press that irons the front and back simultaneously. In some plants, the first finisher either folds the shirt or places it on a hanger, whichever the customer has indicated. A third finisher may do the folding. In some laundries, one shirt finisher performs all these operations.

The jobs of the *drycleaner* (D.O.T. 362.782) and *machine washer* (D.O.T. 361.885) are similar, but the cleaning solution for drycleaning is a chemical solvent instead of water, and drycleaning machines generally are smaller than the laundry washers. The drycleaner sorts clothes according to color, fiber content, and fabric construction and selects the proper time cycle for each load. The drycleaner may apply special prespotting solutions to spots and stains before placing the garments in the drycleaning machine. After cleaning, a special machine removes the solvent and then the clothes are dried in a tumbler or hot-air cabinet. The *spotter* (D.O.T. 362.381) will use chemical reagents and steam to remove stubborn stains. In some plants, the same person does drycleaning and spotting.

If the clothes are made of a material that sheds wrinkles readily, the finisher places them on hangers and puts them in a steam tunnel or steam cabinet. The steam will remove the wrinkles and help the garment regain its shape.

Some clothes, such as men’s suits, are made out of fabrics that require more attention; they are finished differently. A *men’s suit finisher* (D.O.T. 363.782) puts the pants on special “topper” and “legger” presses. The jacket is placed on a body form that may have a second part that comes down to press and shape the shoulders and collar of the jacket while the steam is forced from the inside. Final finishing touches are done on a steam-heated pressing head and “buck,” a flat surface covered in fabric.

An *inspector* (D.O.T. 369.687) checks finished items to see that the



Flatwork finishers shake out folds and creases, spread the sheets on moving belts, and feed them into large flatwork ironing machines.



Some clothes are made of fabrics that require special attention.

quality standards of the plant have been maintained. Any item in need of recleaning or refinishing may be returned to the appropriate department. Occasionally, the inspector works on them instead. Repair work may be forwarded to a mender (D O I 182 884) who sews on buttons, mends tears, and mends seams. Finally, assemblers (D O I 369 581) collect the liners and shirts by matching the sales invoice with the identification marks. Assemblers or baggers (D O I 926 887) may remove tags before putting the items in bags or boxes for storage or headed for by the customer or delivered by the route driver.

In addition to the unique tasks unique to laundry and drycleaning plants, many other workers are found in this industry. The manager or proprietor sees that the plant operates efficiently. Office workers keep records, handle correspondence, and prepare bills. Sales personnel search for new customers. Mechanics keep equipment and machinery operating properly. Some service workers clean, guide, and otherwise maintain the plant, others plan and are related to plant workers. Laborers lift and carry heavy loads to machines. (Many of these occupations are discussed elsewhere in the Handbook.)

Training, Other Qualifications, and Advancement

Many workers in this industry get their first jobs without previous training. Persons who have little formal education can get production line jobs in drycleaning plants. Basic laundry and drycleaning skills may be learned on the job in a short time. Some jobs, such as folding towels and feeding pillowcases and sheets into a flatwork ironer, may require 1 or 2 days to learn. Some finishing jobs—pants presser, or shirt finisher, for example—may require less than a week's training. Other jobs, such as counter clerk, marker, inspector, and assembler, may require several weeks to learn. Several months or more are needed to train a dry cleaner or women's apparel finisher. It may take 6 to 12 months to become a spotter because of the variety of fiber and fabrics, spots and stains, and chemicals used in treating the stains.

Some preemployment training in finishing, drycleaning, and spotting skills is available in vocational high schools and trade schools. Home study courses in all operations of the industry are available from the International Fabricare Institute.

Employers look for dependability, workers who have physical stamina, sharp visual acuity, and keen eyesight.

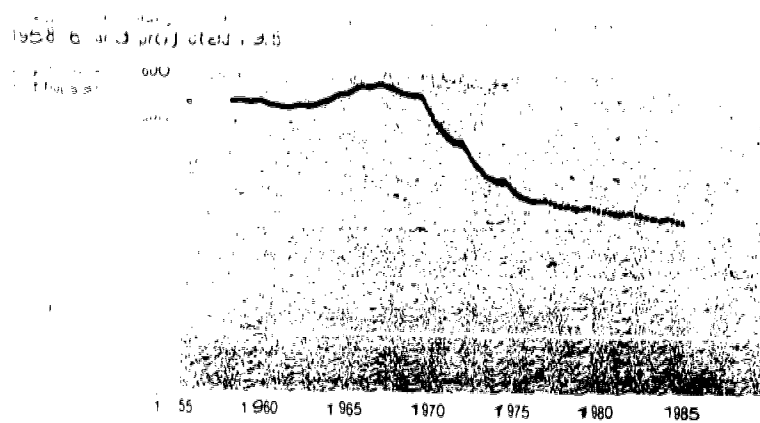
Workers must be able to adjust to the repetitive nature of many laundry and drycleaning jobs.

Advancement for most workers in this industry is limited. Many remain permanently in the same job. Nevertheless, employers occasionally send promising employees to technical or managerial training programs given by the International Fabricare Institute at its facility in Joliet, Ill. Some men's suit finishers become skilled enough to do women's apparel finishing. Markers and assemblers interested in finishing work usually are given an opportunity to move up to this job. Finishers also may become inspectors. Supervisors and managers frequently are chosen from experienced employees already in the industry. Some drycleaners and spotters establish their own drycleaning plants.

Employment Outlook

Employment in this industry is expected to decline through the mid-1980's. Labor-saving machinery and more efficient methods of cleaning and finishing laundry will enable the industry to do more work with fewer employees. Nevertheless, thousands of workers will be hired to replace those who retire, die, or transfer to other fields.

Labor-saving machinery and improved methods enable laundries and drycleaning plants to do more work with fewer employees.



Although the industry's total employment is expected to decline, employment trends will differ among occupations. Employment of spotters is expected to decline because new fibers and finishes make fabrics less stainable. The number of finishers should decrease as machinery does more of the finishing work. On the other hand, more people will be needed in some maintenance occupations to repair the increasing amount of machinery and equipment used by laundry and drycleaning firms. More counter clerks will be required due to growth in the number of retail outlets operated by these firms.

Earnings and Working Conditions

Wage levels in the laundry and drycleaning industry are not high. In 1976, the hourly average wage for nonsupervisory workers in this industry was \$3.26 compared to \$4.36 for all nonsupervisory workers in all service industries and \$4.87 for all such

Workers in private industry, except farming. Earnings are higher for workers in the more highly skilled occupations, such as drycleaner, spotter, and machine washer.

Modern laundry and drycleaning plants are clean and well-lighted. Because of the heat, hot air, and steam of the cleaning processes, the plant may be hot during the summer months. Many new, small drycleaning plants, however, are air-conditioned in the office and customer areas and well ventilated in the machinery areas. In addition, new machinery operates with a minimum of noise. Work in laundries and drycleaning plants is less hazardous than in most manufacturing plants.

Source of Additional Information

The Department of the State, by its consular service may have additional information on training and employment opportunities in this field.

England—where the industry was born—led the rest of the country in the number of textile mills until the early part of this century, when the Southeast became dominant. This shift occurred because the Southeast enjoyed several economic advantages, such as lower labor costs, cheaper steam and electric power, and greater accessibility to cotton. Today, the Northeast employs more people than any other region of the country in manufacturing narrow fabrics such as lace, ribbon, and fabric tape, in weaving and finishing wool, and in the production of miscellaneous textile goods. The South leads the rest of the country in every other sector of this industry. Three states—North Carolina, South Carolina, and Georgia—employ a little over half of all textile workers.

Occupations in the Industry

The raw materials of textile manufacturing must pass through many hands before becoming finished fabrics. As a result, most employees are directly involved in production, either working with their hands or operating machinery.

In the past century, as the basic raw material for the industry, today consumers demand fabrics that are durable and require minimal care while textile manufacturers continually seek cleaner raw materials. Accordingly, synthetic fibers such as nylon or polyester have replaced cotton as the leading raw material for the industry because they are easier for the consumer to care for and easier for the manufacturer to work with. Regardless of the raw material, however, all textiles are produced by spinning the fiber into yarn, weaving or knitting the yarn into fabric, and dyeing and finishing the fabric.

First the fibers must be prepared and spinning. In order to clean and align the fibers, they are carded and combed. Particularly short fibers are removed, and all fibers are drawn into a strand that is strong enough to withstand the twisting process of spinning. Textile workers, called *spinner tenders* (O O T 680.885), *picker tenders* (O O T 680.885), *card tenders* (O O T 680.885), *drawing frame tenders* (O O T 680.885) and

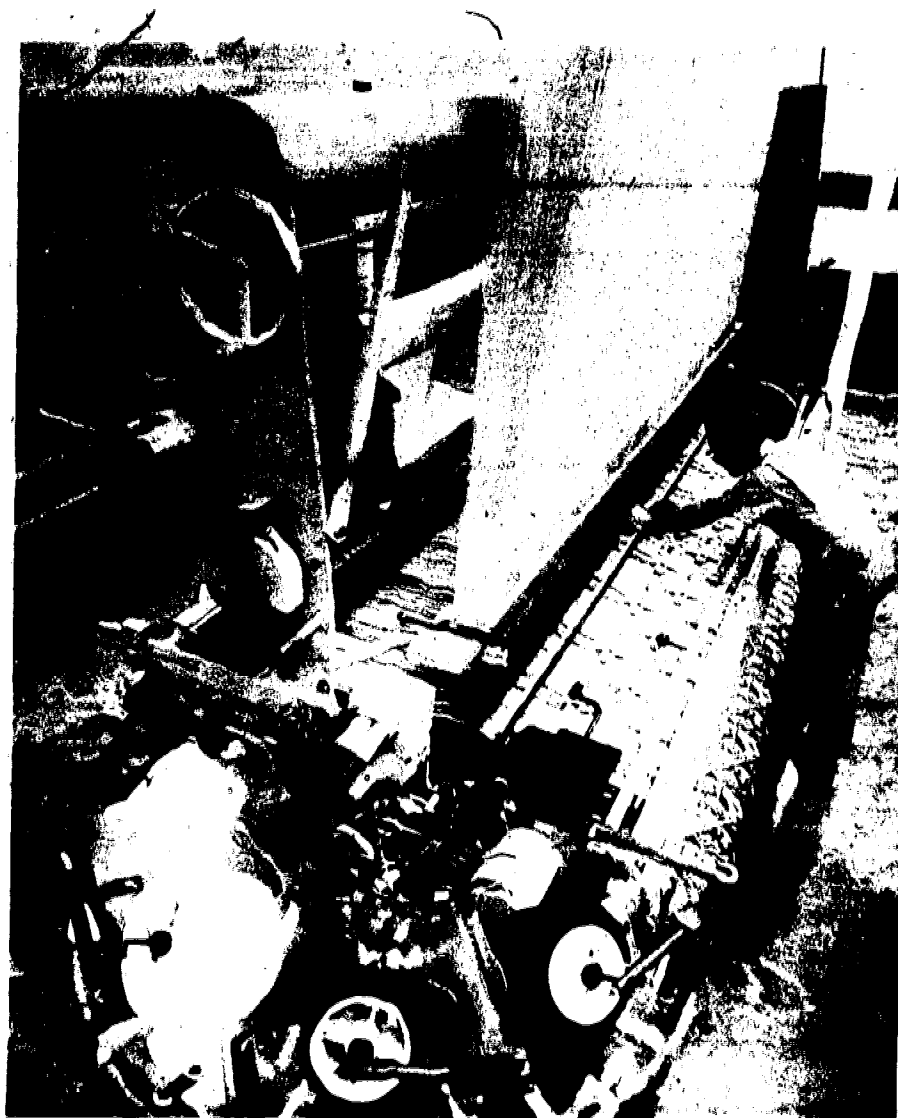
TEXTILE INDUSTRY

The textile industry in the United States is descended to European roots. Indeed, the textile industry was so important to England's prosperity that neither diagrams of the machinery nor the mechanics who operated it were allowed to leave Britain. In 1789, however, an English textile mechanic named Samuel Slater disguised himself as a farmer and sailed to the United States. He carried the details of the machinery where an official would find them. In his head. A few years later he opened a spinning mill in Pawtucket, R.I. Today, the spinning, Jermies Slater built started about a show for textiles. But the industry that began in Pawtucket now includes 7,200 mills and factories produces enough fabric each year to wrap around the earth 250 times, and provides jobs for about 1 million people.

Textile Industry

The textile industry is one of the most important in the United States. It produces a wide variety of goods for use in making clothing and other products. The industry is divided into several branches, including spinning, weaving, and finishing. The spinning branch produces yarn, which is then used in the weaving branch to produce fabric. The finishing branch produces finished fabric, which is then used in the clothing branch to produce garments. The textile industry is a major source of employment in the United States, particularly in the South and Southeast.

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About one-half of all employees in the textile industry work in mills that weave or knit fabric.

roving tenders (D.O.T. 680.865) operate the machinery that prepares the fiber. They start, stop, and clean the machines. While patrolling the aisles between groups of machines, they also repair broken fiber ends and feed fiber into the machines.

* When the fiber is ready for spinning, a spinning frame draws and twists it through rotating rollers and winds it on conical structures called bobbins. These machines, operated by frame spinners, turn the fiber into yarn. *Frame spinners* (D.O.T. 682.885) run rows of spinning frames, position bobbins of fibers, twist fiber ends, repair breaks in lengths of fiber, and clean the machines.

Spinning and weaving or spinning

and knitting generally take place in the same plant. However, weaving and knitting operations usually are performed in different plants because these two methods of cloth manufacture and the machinery used to accomplish them are quite different. To prepare the yarn for weaving, *loom winder tenders* (D.O.T. 689.885), *spooler tenders* (D.O.T. 689.886), *warper tenders* (D.O.T. 681.885), *slasher tenders* (D.O.T. 582.782), and *warp tying machine tenders* (D.O.T. 681.885) position it on their respective machines, draw or thread the yarn into place, tie yarn ends, observe the machines to detect malfunctions, and remove the prepared yarn.

Fabric is produced on looms which

interlace—weave—the yarn. There may be as many as 2,000 looms in the weaving room. *Weavers* (D.O.T. 683.782) constitute about 10 percent of all textile machine operatives. They are skilled workers who monitor and operate as many as 200 looms at a time. They observe fabric being woven to detect and remove defects. They also repair breaks in yarn, fix minor loom malfunctions, and call *loom fixers* (D.O.T. 683.280) to make major repairs. Loom fixers not only repair machines, but also adjust them and prepare them for operation. Each of these highly skilled operatives works with several weavers.

Although most textiles are woven, knitted cloth claims a larger share of the market each year. To knit yarn, a *knitting machine operator* (D.O.T. 685.885) places it on a machine which produces fabric by intermeshing yarn loops. Knitting machine operators tend several machines at a time. They start the machines, feed in the yarn, observe the knitting process to detect malfunctions, tie broken yarn ends, and notify *knitting machine fixers* (D.O.T. 689.280) if they break down. Knitting machine fixers and loom fixers do similar work, but on different machines.

The most highly skilled workers in a knitting mill are *knitter-machine mechanics* (D.O.T. 685.380). They arrange metal pattern plates in the form of chains and place the chains in the knitting machines. The chains control the operation of the machines. Thus, these mechanics provide the means by which textile designs become knitted fabrics.

Once the yarn has been woven or knitted, the resulting fabric is ready to be dyed and finished either by textile mills that also weave or knit the fabric, or by independent businesses. *Dyers* (D.O.T. 582.138) develop dye formulas that are used to create a desired color. They also supervise the dyeing. *Dye weighers* (D.O.T. 550.884) mix the dyes and chemicals used in dyeing. *Dye range operators* (D.O.T. 582.782) run the machines that dye and dry the cloth.

Manufacturers print textiles in thousands of different colors and designs in order to appeal to a variety of consumer preferences. Printing may

be done in several ways. One of the newest methods is rotary screen printing, a system in which a porous cylinder (screen) holds the print design. Dye in the cylinder is forced through the screen as the cylinder rolls over the cloth, leaving the print.

However, before the fabric can receive a print, the design must be created, and *colorists* (D O T 022.181) must develop the colors for printing. *Screen printing artists* (D O T 970.381) then use these colors to make color separations of designs on transparent paper. For each color, *screen makers* (D O T 971.381) prepare a screen, treating it with emulsion and exposing it photographically to the appropriate transparency. *Screen printers* (D O T 652.782) mount the screens on the rotary screen printing machines, fill the machines with dyes, and tend them as they print.

In addition to dyeing and printing, finishing often involves treating the fabric to prevent excessive shrinkage, strengthening it, or providing it with a silky luster. Each step offers job opportunities for textile machine operatives and general maintenance workers. People in a variety of other occupations are important to the industry, although they are not directly involved in production. Among these are *textile designers* (D O T 142.081), *textile engineers* (D O T 183.118), and *textile technologists* (D O T 149.364). These occupations usually require special talents and 2 to 4 years of education after high school.

Textile designers create designs for color, or design the patterns for knitted or fabric garments made on them. Most designers work in New York City, where the designing and styling departments of most textile companies are located.

Textile engineers work in advisory or managerial positions. They may be plant managers who supervise entire plants, or plant engineers responsible for the heating, air conditioning, electrical, materials handling, or other systems in textile establishments.

Textile technologists convert fiber properties into useful end products. They may work in research, developing new fiber processing techniques

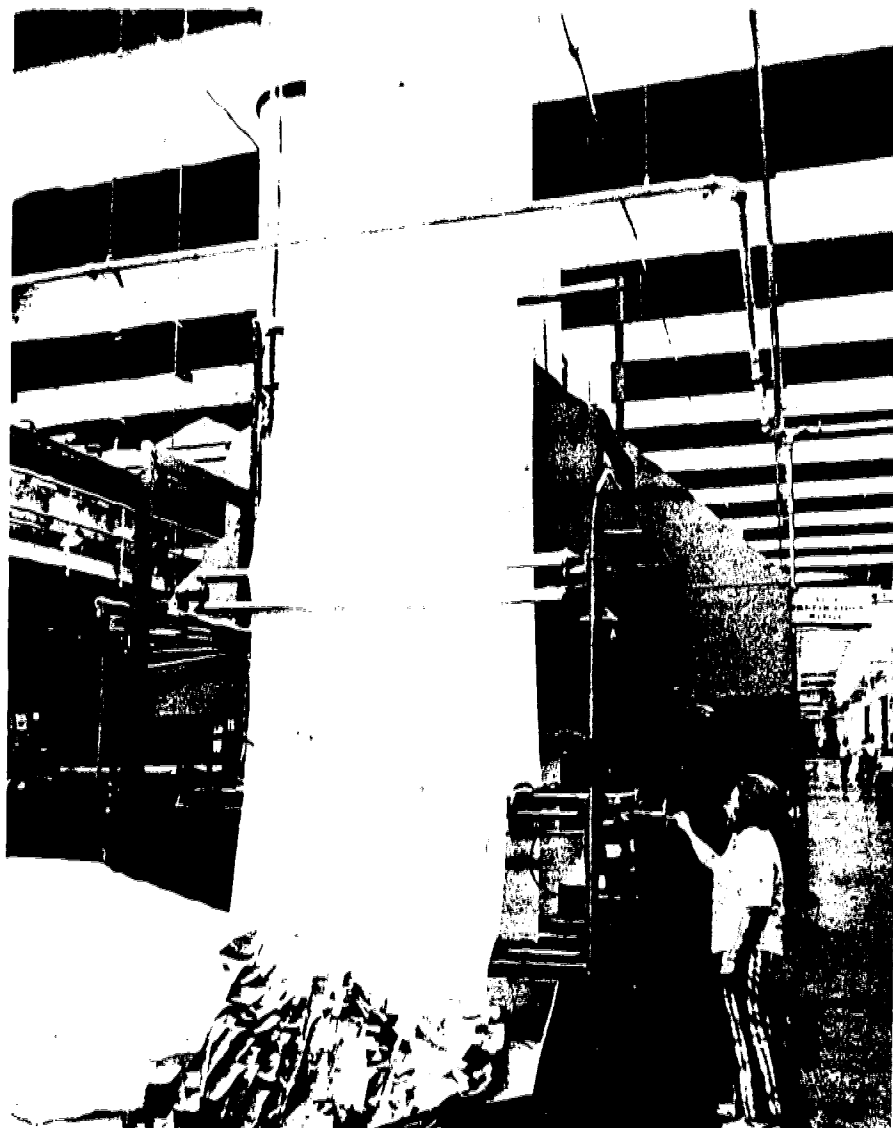
in quality control and production, measuring major characteristics of raw textiles; or in customer sales and service, selling directly to customers or serving them. Many technicians work in the dyeing and finishing areas of textile plants.

In addition to occupations that are unique to the manufacture of textiles, many others are found in this industry. There are managers such as plant and department managers in all areas of the textile industry. Personnel specialists hire employees, and make sure that pay and benefits are received. There are jobs for bookkeepers, accountants, and computer programmers. The industry employs

a wide assortment of clerical workers as well, including secretaries, computer console operators, and shipping and receiving clerks. There also are jobs for janitors, guards, and food service workers. Mechanics and repairers, besides those already mentioned, keep machinery and equipment operating properly. Laborers, such as freight and material handlers, often using mechanical devices, lift and move heavy loads to various textile machines.

Training, Other Qualifications, and Advancement

Most occupations in the textile industry are machine operative jobs



Most occupations in the textile industry are machine operative jobs that can be learned on the job.

that can be learned on the job. Other occupations require additional training and special skills. A small share of jobs is held by workers trained in professional fields.

Training for most production jobs is provided on the job and lasts from a few weeks to a few months, depending on the complexity of the work. Methods of instruction vary, but usually an employee starts out by assisting an experienced worker. Some mills set aside a section of the plant where full-time instructors of ten former machine operators—show new workers how to operate the machines. Persons from outside the textile plant sometimes provide instruction. For example, manufacturers might explain the operation of new equipment or State educational coordinators might organize and conduct training programs at the request of the company.

Good coordination, good eyesight, and manual dexterity are important requirements for production jobs in this highly mechanized industry. Although most textile employers prefer that production workers have a high school education, they often do not require it.

Only a small percentage of workers in this industry are trained through apprenticeship programs. However, there are such programs ranging in length from 2 to 4 years for dyers, weavers, loom fixers, electricians, and some other occupations. Persons interested in these programs should contact a textile employer or a local State employment service office.

Some production workers are promoted to instructors and train new employees. Others may advance to supervisory or management positions after having shown interest and ability at jobs of increasing responsibility. Most textile companies have training programs to help an employee advance in skilled occupations; many pay all or part of the tuition for courses taken at private and public schools and colleges which the company determines would help the employee advance to positions of increased responsibility.

Textile designers and textile technicians need training at a technical institute, a technically oriented ju-

nior college, or a 4-year textile college. Talent, demonstrated in high school courses in art, drawing, and design, indicates a potential for success in the textile design field, although competition for jobs in these fields may be stiff. Textile designers need a vivid and fertile imagination, a feeling for color and design, sensitivity to consumers' desires, and the ability to visualize the effect of designs on cloth. Qualifications of a good textile technician include manual dexterity, the ability to communicate well, both orally and in writing, and patience with details. High school courses in algebra, geometry, chemistry, physics, and English are good preparation for textile technician jobs. Advancement for a textile technician often means promotion to a supervisory position such as department head or blue-collar worker supervisor in the company's production division.

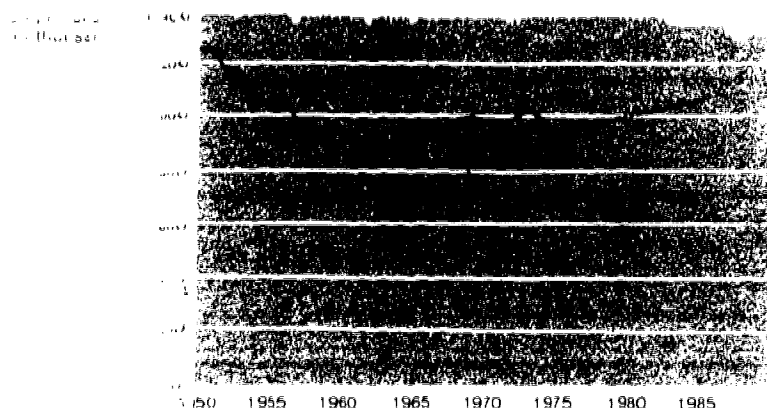
Graduates of 4-year colleges hold the majority of management jobs in textile companies. Textile manufacturers are particularly interested in those with degrees in engineering and business-related subjects although the industry employs graduates with degrees in various fields including liberal arts and business. Also, graduates of textile colleges or those who majored in textile curriculums often have a head start on ad-

vancement to management positions. Textile curriculums include studies in various phases of the manufacturing process or in the operation of the industry, such as textile engineering, textile chemistry, or textile management. Ten colleges in the United States offer 4-year undergraduate degrees in textiles; most of these institutions are located in the northeastern and southeastern parts of the country. High school courses in mathematics and the physical sciences are good preparation for pursuing degrees in textile engineering or chemistry, while courses in business and economics provide a good basis for pursuing a degree in textile management.

Many college graduates begin careers in the textile industry as management trainees. Training programs may extend over several months and are usually designed to expose a new employee to all facets of the company—its organization, policies, manufacturing processes, and merchandising techniques. Programs include classroom instruction, plant site visits, and management internships in various departments of a company. Having completed their training, many of them move into manufacturing supervisory jobs, from which they often advance to positions of increasing responsibility.

Employment in textile manufacturing which declined in the 1950's is expected to continue at recent levels

Employment in the textile mill products manufacturing industry, 1950-6 and projected 1965



Upper level management positions in textile companies include plant engineer and plant manager. College graduates with degrees in engineering eventually may become engineers for an entire plant. Those who become plant managers frequently have degrees in textile engineering or textile management, as well as the demonstrated ability to lead and motivate people.

Employment Outlook

Textile industry employment growth is expected to be slower than the average for all industries through the mid-1980's. Many more job openings will result from persons leaving the industry because of death, retirement, or for other reasons than from employment growth. The demand for textile employees, particularly skilled and semiskilled workers, will be greatest in the Southeast.

Textile output is expected to expand over the next decade in response to demand from the apparel and home furnishings industries which are spurred by growth in population and incomes. An anticipated increase in the variety of textile products also should contribute to growth in output. In addition, although competition from imports has diminished the demand for domestic products of some sectors of this industry, recent negotiation of a new international trade agreement limiting textile imports probably will weaken this competition.

Textile employment is expected to grow more slowly than the industry's output, however, since labor-saving machinery and the use of synthetic fibers increase worker productivity. Numerous improvements in machines and production processes will continue to reduce demand for workers in yarn manufacture and weaving. Electronic instrumentation, which reduces the need for maintenance workers, is expected to become increasingly important. Also, the coming decade will see the greater use of computers as a management tool and as a means of controlling parts of the production process.

Although the adoption of technologically advanced machinery will di-

minish the need for semiskilled and unskilled workers, the demand for skilled workers and professional and managerial personnel will increase. Skilled production workers, such as knitter machine mechanics and dyers, will become more essential as textile machinery increases in complexity. New technologies, such as computer processing and electronic instrumentation, will require more textile technicians and computer specialists. The industry's demand for college graduates in textile engineering and textile management also will grow. Federal Government safety and health regulations as well as scientific research and development will continue to stimulate demand for chemists, and mechanical, electrical, and industrial engineers.

Earnings and Working Conditions

Average hourly earnings of production workers in the textile industry in 1976 were below those of production workers in all manufacturing industries—\$3.67 versus \$5.19.

In 1976, production workers' average wages ranged from \$3.44 an hour in yarn and thread mills to \$3.97 an hour in textile finishing plants. There also is some variation in wages by geographic area. A 1975 Bureau of Labor Statistics survey of weaving mills and yarn and thread mills indicated average earnings of production workers in the Southeast were \$3.07 an hour, in New England \$3.17 an hour, and in the Middle Atlantic region \$3.33 an hour. Table 1 gives estimated average hourly earnings in 1975 for selected occupations and

regions in one segment of the industry. According to limited information, starting salaries for professional workers in the textile industry ranged from \$10,000 to \$12,000 a year in 1976.

Although some textile production workers are paid according to incentive plans—i.e. according to how much they produce—about 3 out of every 4 are paid time rates. Workers usually paid under incentive wage plans include drawing-frame tenders, spooler tenders, and weavers.

Although the average workweek for textile production workers is close to 40 hours, about the same for production workers in all manufacturing industries, many textile employees, particularly in the Southeast, work 46 to 48 hours a week. Most textile mills operate 24 hours a day, each day divided into three shifts. A shift differential is usually paid to those who work the 3d, or late, shift.

There are few seasonal influences on textile plant operation. When there is a lack of work due to recession or for some other reason, the textile industry usually chooses to reduce operations by 1 or 2 days a week rather than close down the plants altogether.

Although most textile employees work with or near machinery, the accident rate for the industry is slightly lower than the average for all manufacturing industries. Some workers, however, are subjected to noise from machinery. Most employees work in newer buildings where temperature and humidity controls are common, although lint laden air

Table 1. Average Hourly Earnings of Production Workers in Weaving Mills and Yarn and Thread Mills Industries, Selected Occupations and Areas, 1975

Weaving mills and yarn and thread mills	Estimated Average Hourly Earnings		
	New England	Middle Atlantic	Southeast
Production workers	\$3.17	\$3.33	\$3.07
Carders	3.41		2.85
Frame spinners	3.08		2.93
Slasher tenders	3.53	3.33	3.35
Warper tenders	3.08	3.70	3.02
Loom fixers	3.82	4.68	4.05
Weavers	3.62	4.07	3.55

Not available.

and poor lighting are problems in some older plants.

Benefits for textile employees in both unionized and nonunionized plants usually include paid holidays and vacations, pensions or retirement plans, hospitalization insurance, and sick pay. Additional benefits provided by labor-management agreements in unionized plants include provisions for arbitration of grievances and protection of workers from the unfavorable effects of technological change such as layoffs and undesirable changes in work assignments.

About one-fifth of all textile workers are members of labor unions, whereas about half of all manufacturing workers are union members. The major textile unions are the Amalgamated Clothing and Textile Workers Union (ACTWU) and the United Textile Workers of America (UTWA).

Sources of Additional Information

Information on vocational education for occupations in the textile industry is available from the Division

of Vocational Education of the Department of Education in each State.

For information on educational requirements and occupational descriptions, write to:

American Textile Manufacturers Institute,
Wachovia Center, 400 S. Tryon St., Charlotte, North Carolina 28285

United Textile Workers of America, 420 Common St., Lawrence, Mass. 01840

For information regarding specific jobs in your area, contact the local office of the State employment service.

What to Look For in this Reprint

To make the *Occupational Outlook Handbook* easier to use, each occupation or industry follows the same outline. Separate sections describe basic elements, such as work on the job, education and training needed, and salaries or wages. Some sections will be more useful if you know how to interpret the information as explained below.

The TRAINING, OTHER QUALIFICATIONS, AND ADVANCEMENT section indicates the preferred way to enter each occupation and alternative ways to obtain training. Read this section carefully because early planning makes many fields easier to enter. Also, the level at which you enter and the speed with which you advance often depend on your training. If you are a student, you may want to consider taking those courses thought useful for the occupations which interest you.

Besides training, you may need a State license or certificate. The training section indicates which occupations generally require these. Check requirements in the State where you plan to work because State regulations vary.

Whether an occupation suits your personality is another important area to explore. For some, you may have to make responsible decisions in a highly competitive atmosphere. For others, you may do only routine tasks under close supervision. To work successfully in a particular job, you may have to do one or more of the following:

- motivate others
- direct and supervise
- work with all types of people
- work with things
- work with machines and manual equipment
- work independently
- self-discipline
- work as part of a team
- work with details
- prepare laboratory reports
- teach people
- use creative imagination
- work in a confidential way
- do physically hard work
- work outside in all types of weather

The following table shows the expected growth rate for all occupations from 1976 to 1985. The following phrases are used:

Much faster	40% or more
Fast	15.0% to 39.9%
About average	10.0% to 14.9%
Slow	5.0% to 9.9%
Little change	0.0% to 4.9%
Decline	4.0% or more

generally, job growth is expected to be at least as fast as the economy as a whole. But, you would have to know the number of openings with you to be sure of your prospects. Unfortunately,

supply information is lacking for most occupations.

There are exceptions, however, especially among professional occupations. Nearly everyone who earns a medical degree, for example, becomes a practicing physician. When the number of people pursuing relevant types of education and training and then entering the field can be compared with the demand, the outlook section indicates the supply/demand relationship as follows:

Excellent	Demand much greater than supply
Very good	Demand greater than supply
Good or favorable	Rough balance between demand and supply
Fair, fair competition	Likelihood of more supply than demand
Poor competition	Supply greater than demand

Even if there are few job openings should not stop your pursuit of a career that matches your aptitudes and interests. Even small or overcrowded occupations provide some jobs. So do those in which employment is growing very slowly or declining.

Growth in an occupation is not the only source of job openings because the number of openings from turnover can be substantial in large occupations. In fact, replacement needs are expected to create 70 percent of all openings between 1976 and 1985.

Earnings by occupation in your area may differ from those in other areas or a whole. Your State employment service can furnish local information.

The EARNINGS section shows that earnings are based on the following factors:

1. **Base pay.** The most common question is, "How much?" The answer is, "It varies." The information is a guide for only one type of earnings—wages and salaries—and not even this for all occupations. Although 9 out of 10 workers receive this form of income, many earn extra money by working overtime, night shifts, or in irregular schedules. In some occupations, workers also receive tips or commissions based on sales or service. Some factory workers are paid a piece rate—an extra payment for each item they make.

2. **Benefits.** These include health insurance, life insurance, and pension plans. These benefits are included in many occupations: physicians, barbers, writers, and farmers, for example. Earnings for self-employed workers even in the same occupation differ widely because much depends on whether one is just starting out or has an established business.

3. **Most wages and salary workers receive a large bonus as paid vacations, holidays, and sick leave.** Workers also receive income in goods and services (paid in kind). Sales workers in department stores, for example, often receive discounts on merchandise.

4. **Despite difficulties in determining exactly what people earn in a job, the Earnings section does compare occupational earnings by indicating whether a certain job pays more or less than the average for all nonsupervisors in private industry, excluding farming.**

Each occupation has many pay levels. Beginners almost always earn less than workers who have been on the job for some time. Earnings also vary by geographic location but cities that offer the highest earnings often are those where living costs are most expensive.

What's an ad for the OOOQ doing in a place like this?

The career information contained in the reprint you are reading was taken from the 1978-79 edition of the Occupational Outlook Handbook. But the Handbook is not the only source of useful career information published by the Bureau of Labor Statistics. The Handbook's companion, the Occupational Outlook Quarterly, is published four times during the school year to keep subscribers up to date on new occupational studies completed between editions of the Handbook. The Quarterly also gives practical information on training and educational opportunities, salary trends, and new and emerging jobs—just what people need to know to plan careers.

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